Waterford Flat Quadrangle, Maine

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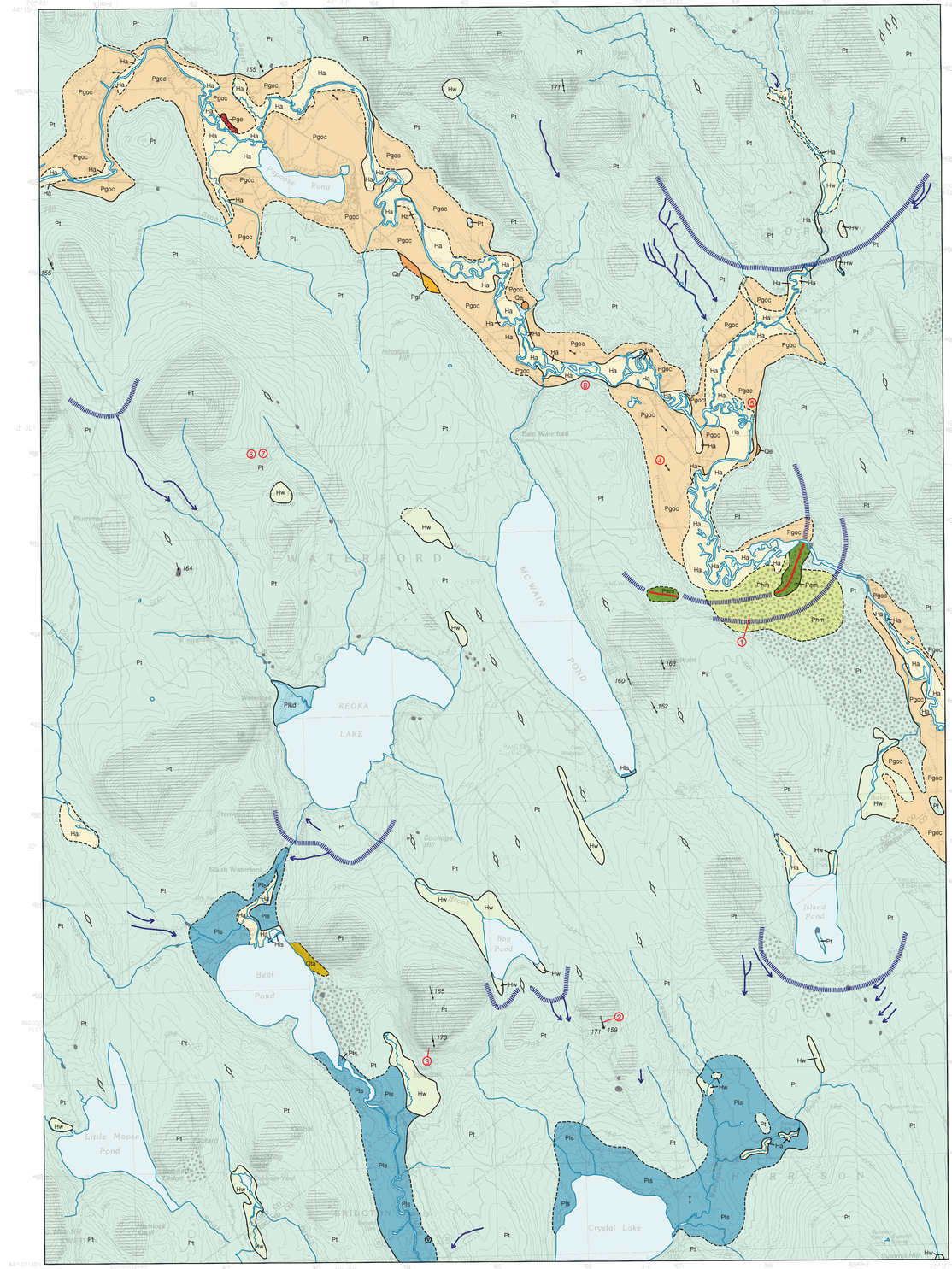
Surficial Geology



SOURCES OF INFORMATION

Surficial geologic mapping by Woodrow B. Thompson during the 1999 field season; funding for this work provided by the U.S. Geological Survey STATEMAP program and the Maine Geological Survey, Department of Conservation.

Quadrangle Location

SCALE 1 : 24,000

1 0 1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 0 1 KILOMETER

CONTOUR INTERVAL 20 FEET

TRUE NORTH

Topographic base from U.S. Geological Survey Waterford Flat quadrangle, scale 1:24,000 using standard U.S. Geological Survey topographic map symbols.

The use of industry, firm, or local government names on this map is for location purposes only and does not impute responsibility for any present or potential effects on the natural resources.

Ha — **Stream alluvium -** Sand, gravel, silt, and organic sediment. Deposited on flood plains of modern streams. Unit may include some wetland areas.

Hw — **Wetland deposits -** Peat, muck, silt, and clay. Deposited in poorly drained areas.

Hls — **Shoreline deposits -** Sand and gravel on shores of modern lakes.

Qe — **Eolian deposits -** Windblown sand. Forms dunes and blanket deposits on the sides of the Crooked River valley.

Qta — **Talus deposits -** Large boulders below cliff on west side of Bear Mountain.

Pgoc — **Crooked River outwash deposits -** Sand and gravel. Outwash deposited by glacial meltwater streams in the Crooked River valley.

Pgi — **Ice-contact deposits -** Sand and gravel. Deposited when remnants of stagnant glacial ice still existed in the Crooked River valley. Locally collapsed and kettled from melting of adjacent ice.

Pkd — **Glacial Lake Keoka deposits -** Deltaic sand and gravel deposited into a late-glacial lake that was slightly higher than the present Keoka Lake.

Pls — **Glacial Lake Sebago deposits -** Deltaic and lake-bottom sand, silt, and gravel. Deposited in a glacial lake that occupied the Bear Pond-Bear River valley and the Crystal Lake-Woodsum Brook valley.

Pge — **Esker deposits -** Sand and gravel deposited by glacial meltwater flowing in tunnels within or beneath the ice.

Phm — **Hummocky moraine -** Glacial till with hummocky topography. May contain lenses of sand and gravel. Large boulders commonly present on ground surface.

Pem — **End moraine -** Till ridge deposit at glacier margin. May include large boulders.

Pt — **Till -** Loose to very compact, poorly sorted, massive to weakly stratified mixture of sand, silt, and gravel-size rock debris deposited by glacial ice. Locally includes lenses of waterlaid sand and gravel.

Bedrock outcrops / thin drift areas - Ruled pattern indicates areas where outcrops are common and/or surficial sediments are generally less than 10 ft thick (mapped partly from air photos). Dots show individual outcrops.

Contact - Boundary between map units. Dashed where very approximate.

Ice-margin position - Line shows approximate position of the glacier margin during ice retreat, based on positions of meltwater channels and/or morainal deposits.

Moraine ridge - Line shows crest of moraine ridge in area mapped as end moraine.

Glacially streamlined hill - Symbol shows trend of long axis, which is parallel to former glacial ice-flow direction.

Glacial striation locality - Arrow shows ice-flow direction inferred from striations on bedrock. Dot marks point of observation. Number is azimuth (in degrees) of flow direction. Flagged trend is older.

Dip of cross bedding - Arrow shows average dip direction of cross bedding in fluvial or deltaic deposits, which indicates direction of stream flow or delta progradation. Point of observation at tip of arrow.

Meltwater channel - Channel eroded by glacial meltwater stream. Arrow shows inferred direction of former stream flow.

Crest of esker - Shows trend of esker ridge. Chevrons point in direction of meltwater flow.

Area of many large boulders, where observed. May be more extensive than shown.

Varve locality - Site where annually layered (varved) silty lake-bottom sediments have been found.

Photo locality - Location of photographed site shown and described in map legend.

USES OF SURFICIAL GEOLOGY MAPS

A surficial geology map shows all the loose materials such as till (commonly called hardpan), sand and gravel, or clay, which overlie solid ledge (bedrock). Bedrock outcrops and areas of abundant bedrock outcrops are shown on the map, but varieties of the bedrock are not distinguished (refer to bedrock geology map). Most of the surficial materials are deposits formed by glacial and deglacial processes during the last stage of continental glaciation, which began about 25,000 years ago. The remainder of the surficial deposits are the products of postglacial geologic processes, such as river floodplains, or are attributed to human activity, such as fill or other land-modifying features.

The map shows the areal distribution of the different types of glacial features, deposits, and landforms as described in the map explanation. Features such as striations and moraines can be used to reconstruct the movement and position of the glacier and its margin, especially as the ice sheet melted. Other ancient features include shorelines and deposits of glacial lakes or the glacial sea, now long gone from the state. This glacial geologic history of the quadrangle is useful to the larger understanding of past earth climate, and how our region of the world underwent recent geologically significant climatic and environmental changes. We may then be able to use this knowledge in anticipation of future similar changes for long-term planning efforts, such as coastal development or waste disposal.

Surficial geology maps are often best used in conjunction with related maps such as surficial materials maps or significant sand and gravel aquifer maps for anyone wanting to know what lies beneath the land surface. For example, these maps may aid in the search for water supplies, or economically important deposits such as sand and gravel for aggregate or clay for bricks or pottery. Environmental issues such as the location of a suitable landfill site or the possible spread of contaminants are directly related to surficial geology. Construction projects such as locating new roads, excavating foundations, or siting new homes may be better planned with a good knowledge of the surficial geology of the site. Refer to the list of related publications below.

OTHER SOURCES OF INFORMATION

1. Thompson, W. B., 2000, Surficial geology of the Waterford Flat 7.5' quadrangle, Maine: Maine Geological Survey, Open-File Report 00-136.
2. Locke, D. B. and Thompson, W. B., 2000, Surficial materials of the Waterford Flat quadrangle, Maine: Maine Geological Survey, Open-File Map 00-134.
3. Neil, C. D., 1998, Significant sand and gravel aquifers of the Waterford Flat quadrangle, Maine: Maine Geological Survey, Open-File Map 98-214.
4. Thompson, W. B., 1979, Surficial geology handbook for coastal Maine: Maine Geological Survey, 68 p. (out of print).
5. Thompson, W. B., and Borns, H. W., Jr., 1985, Surficial geologic map of Maine: Maine Geological Survey, scale 1:500,000.
6. Thompson, W. B., Crossen, K. J., Borns, H. W., Jr., and Andersen, B. G., 1989, Glaciomarine deltas of Maine and their relation to late Pleistocene-Holocene crustal movements, *in* Anderson, W. A., and Borns, H. W., Jr. (eds.), Neotectonics of Maine: Maine Geological Survey, Bulletin 40, p. 43-67.